

REMARKS

Claim 3 is pending in this application. By this Amendment, the Abstract is amended. No new matter is added by this amendment. Reconsideration of the application in view of the above amendment and the following remarks is respectfully requested.

The Office Action objects to the Abstract of the disclosure. The Abstract has been amended to shorten the length of the abstract to overcome the objection. Applicant respectfully requests that the objection be withdrawn.

The Office Action rejects claim 3 under 35 U.S.C. §103(a) over U.S. Patent No. 5,960,627 to Krampe et al. (hereinafter "Krampe"). The rejection is respectfully traversed.

Claim 3 calls for an eight cylinder engine with a first valve drive unit for driving fuel injection valves to open and close which are provided on the first cylinder, the fourth cylinder, the sixth cylinder and the seventh cylinder by energizing these fuel injection valves, and a second valve drive unit for driving the fuel injection valves to open and close which are provided on the second cylinder, the third cylinder, the fifth cylinder and the eighth cylinder by energizing these fuel injection valves.

The Office Action, on page 3, places Applicant on official notice of design choice that the above mentioned features of claim 3 are known techniques of the design arrangement of a drive unit for controlling the specific injection valves to specific cylinders.

Applicant respectfully traverses the official notice of design choice. The known design for controlling the specific injection valves to specific cylinders is disclosed in Fig. 8 and is discussed on page 3, lines 9-13 of the current application. In the known design, there are two valve drive units, as called for in claim 3. However, each of the valve drive units controls a corresponding bank of cylinders (Fig. 8, cylinders 1, 3, 5 and 7 are the first bank of cylinders and are controlled by the first valve drive unit and cylinders 2, 4, 6 and 8 are the second bank of cylinders and are controlled by the second valve drive unit).

The above-mentioned known design is the same design disclosed within Krampe for a four and eight cylinder engine. In Krampe, the control unit 170 controls the solenoid valves 130-133, which are then used to inject fuel into the corresponding bank of cylinders (Fig. 1 and col. 5, lines 28-32). Krampe's Figs 5a and 5b, disclose how the known design from Fig. 1 for a four cylinder engine, can then be applied to an eight cylinder engine. The control units are used to control each corresponding bank of cylinders. There is no disclosure within Krampe as to the possibility of having a control unit control two cylinders on the first bank of cylinders and two of the cylinders on the second bank of cylinders.

Based on the arrangement of Krampe, the combustion and expansion strokes of the cylinders are generated at unequal intervals and the valve drive units do not always have sufficient time to charge. The failure of a valve drive unit to sufficiently charge can cause deterioration in the precision of the fuel injection. (Page 3, lines 14-28)

The combination of features recited in claim 3 solves this problem in that the first valve drive unit controls two cylinders within the first group of cylinders (i.e., the first and seventh cylinders) and two cylinders within the second group of cylinders (i.e., fourth and sixth cylinders). The second valve drive unit controls the remaining cylinders within the first group of cylinders (i.e., the third and fifth cylinders) and second group of cylinders (i.e., second and eighth cylinders). This design allows for combustion and expansion strokes of the cylinders to occur at equal intervals. As a result, both of the valve drive units have sufficient time to charge and there is no deterioration in the precision of fuel injection. (Page 14, lines 8-17)

For the reasons discussed above, the Office Action's official notice of design choice is hereby traversed as Applicant has stated why the first and second valve drive unit design is not considered to be well-known in the art. Applicant thus demands that the Examiner produce authority for his statement.

Accordingly, Applicant respectfully requests withdrawal of the rejection.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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JAO:RHR/axl

Attachment:
Substitute Abstract

Date: December 4, 2007

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